Mortar

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Outline:

Mortar

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What is the mortar?

Mortar is a workable paste used to bind construction blocks together and fill the gaps between them. The blocks may be stone, brick, cinder blocks, etc. Mortar becomes hard when it sets.

Mortar component:

Mortar is made of four basic ingredients:

1. Portland Cement

2. Hydrated Lime

3. Sand

4. Water

We'll also take a good look at masonry cement. This is a manufactured, premixed, packaged combination of Portland cement, hydrated lime and optional admixtures.

Masonry cement is so much easier to use that you don't often find anyone mixing mortar from scratch at a job site anymore although it is a cost effective way to do it.

Types of Mortar:

There are many types of Mortar

Ancient mortar

Portland cement mortar

Polymer cement mortar

Lime mortar

Pozzolana mortar

Ancient Mortar:

The first mortars were made of mud and clay.

Because of a lack of stone and an abundance of clay, Babylonian constructions were of baked brick, using lime or pitch for mortar. According to Roman Ghirshman the first evidence of humans using a form of mortar was at the ziggurat of Sialk in Iran, built of sun-dried bricks in 2900 BC.

Portland cement mortar:

Portland cement mortar (often known simply as cement mortar) is created by mixing Ordinary Portland cement (OPC), hydrated lime, and aggregate (or sand) with water.

It was invented in 1794 by Joseph Aspin and patented on 18 December

1824, largely as a result of various scientific efforts to develop stronger mortars than existed at the time. Portland cement sets hard and quickly, allowing a faster pace of construction, and requires fewer skilled workers.

Polymer cement mortar:

Polymer cement mortars (PCM) are the materials which are made by partially replacing the cement hydrate binders of conventional cement mortar with polymers. The polymeric admixtures include latexes or emulsions, redispersible polymer powders, water-soluble polymers, liquid resins and monomers. It has low permeability, and it reduces the incidence of drying shrinkage cracking, mainly designed for repairing concrete structures. For an example see MagneLine.

Lime mortar:

The speed of set can be increased by using impure limestone in the kiln, to form a hydraulic lime that will set on contact with water. Such a lime must be stored as a dry powder. Alternatively, a pozzolanic material such as calcined clay or brick dust may be added to the mortar mix. This will have a similar effect of making the mortar set reasonably quickly by reaction with the water in the mortar.

Lime mortar is considered breathable in that it will allow moisture to freely move through it and evaporate from its surface. In old buildings with walls that shift over time, there are often cracks which allow rain water into the structure. The lime mortar allows this moisture to escape through evaporation and keeps the wall dry. Reappointing or rendering an old wall with cement mortar stops this evaporation and can cause problems associated with moisture behind the cement


Traditional
LIME MORTAR
Mike Wye & Associates
Tel/Fax: 01409-281-644
www.mikewye.co.uk

Pozzolana mortar:

Pozzolana is a fine, sandy volcanic ash, originally discovered and dug in Italy at Pozzuoli in the region around Mount Vesuvius, but later at a number of other sites. The ancient Roman architect Vitruvius speaks of four types of pozzolana. It is found in all the volcanic areas of Italy in various colors: black, white, grey and red.

Finely ground and mixed with lime it acts like Portland cement and makes a strong mortar that will also set under water.

Mixing of Mortar:

Mechanical Mixing

Site Mixed Mortar

Hand Mixing

Pre-mixed Mortar

Mechanical Mixing:

This is usually done in a concrete mixer. A small amount of mixing water is placed in the mixer followed by the sand, cement and then lime. More water is then slowly added to create a thick creamy mortar. Each batch should be thoroughly mixed for three minutes to ensure that a uniform consistency is obtained.

Site Mixed Mortar:

• When site mixing, it is important to carefully measure the material by volume in a suitable container (i.e. a bucket) not by shovelfuls.

Hand Mixing:

Mixing should be done in a clean wheelbarrow or on a mixing board to avoid contamination.

The raw materials should be combined and mixed to an even colour prior to adding water.

Water is then slowly added with the continuous turning of the mix until a thick creamy mortar is obtained. It is important that mortars are used within an hour of mixing and should not be retempered by the addition of water.

Pre-mixed Mortar:

Adelaide Brighton Cement manufactures a range of premium grade packaged mortars which are available in 2kg bags for ease of handling. These are available at your local hardware store or landscape supplies outlet and require only the addition of clean water and mixing prior to use. On a clean surface, slowly add the water whilst mixing until a uniform, workable consistency is obtained.

Supplying the mortar:

Mortars are supplied to the job site in three ways:

- Site mixed - the mortar is prepared on site by the mason.

Pre-mixed wet - the mortar is commercially prepared off-site and shipped in tubs ready to use. A retarder is added to the mixture to ensure the mortar in tubs does not set up before being placed in the wall.

Pre-mixed dry - the mortar is commercially prepared off-site.

Water is added to the mix by the mason on site.

The supply of mortar is not typically specified but rather determined by the mason based on site conditions.

USES OF MORTAR:

(1) To bind masonry units like stones, bricks and hollow cement blocks.

(2) To give impervious surface to roof slab and walls (plastering).

(To give neat finishing to concrete works.

(4) For pointing masonry joints.

(5) For preparing hollow blocks.

THANKS….!

For Your Attention